Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1.-8. (canceled)

9. (currently amended) A method for optical transmission of a polarization division multiplexed signal having two orthogonal polarized optical data signals whose first carrier signal and second orthogonal carrier signal respectively ~~signals~~ have the same wavelengths and are modulated by data signals, comprising:

shifting the phase of the first carrier signal and the second carrier orthogonal signal ~~signals~~ so that the first carrier signal of said two orthogonal polarized optical data signals are phase shifted 90° relative to one another, wherein the phase difference between the carrier signals is controlled.

10. (previously presented) The method as claimed in claim 9, wherein that to obtain a phase control criterion the circular polarization component of the polarization division multiplexed signal is measured to provide a control signal.

11. (previously presented) The method as claimed in claim 10, further comprising:

tapping off a measurement signal from the polarization division multiplexed signal; and

splitting the tapped measurement signal into two identical signal components, one of which is converted directly into a first electrical sub-signal, the other is first fed via a $\lambda/4$ plate tuned to the wavelength of the carrier signals and a polarization filter and then converted into a second electrical sub-signal, wherein the two signal components are compared with one another to obtain a control signal,

and wherein the phase between the carrier signals is varied so that electrical sub-signals have the same values.

12. (previously presented) The method as claimed in claim 9, further comprising:

tapping off a measurement signal from the polarization division multiplexed signal to obtain a phase control criterion; and

feeding the measurement signal to a DGD element tuned to the wavelength of the carrier signals, wherein an output signal of the DGD element is converted into an electrical signal, whereby a measured an a control signal is obtained, and wherein the phase between the carrier signals is varied so that the output signal of the DGD element attains an extreme value.

13. (previously presented) The method as claimed in claim 12, wherein polarization planes of the orthogonal data signals have an angle of ±45° relative to a main axes of the DGD element.

14. (previously presented) The method as claimed in claim 9, further comprising:

tapping off a measurement signal from the polarization division multiplexed signal to obtain a phase control criterion; and

splitting the measurement signal into two mutually orthogonal signal components. wherein the orthogonal signal components are converted into electrical signal components, and wherein the control signal is obtained from the amplitudes of the electrical signal components.

15. (previously presented) The method as claimed in claim 14, wherein polarization planes of the orthogonal signals are set ±45° to a polarization plane of a polarization splitter, and wherein the phase between the carrier signals is varied so that that the amplitudes of the electrical signal components have identical values.

16. (previously presented) A method for optical transmission of a polarization division multiplexed signal having two orthogonal data signals whose carrier signals

have the same wavelengths and are modulated by data signals, comprising:

shifting the phase of the carrier signals so that the carrier signals are phase shifted 90° relative to one another, the phase difference between the carrier signals is controlled;

tapping off a measurement signal from the polarization division multiplexed signal to obtain a phase control criterion; and

feeding the measurement signal to a DGD element tuned to the wavelength of the carrier signals, wherein an output signal of the DGD element is converted into an electrical signal, whereby a measured an a control signal is obtained, and wherein the phase between the carrier signals is varied so that the output signal of the DGD element attains an extreme value.

17. (previously presented) The method as claimed in claim 16, wherein polarization planes of the orthogonal data signals have an angle of ±45° relative to a main axes of the DGD element.

18. (previously presented) A method for optical transmission of a polarization division multiplexed signal having two orthogonal data signals whose carrier signals have the same wavelengths and are modulated by data signals, comprising:

shifting the phase of the carrier signals so that the carrier signals are phase shifted 90° relative to one another, the phase difference between the carrier signals is controlled;

tapping off a measurement signal from the polarization division multiplexed signal to obtain a phase control criterion; and

splitting the measurement signal into two mutually orthogonal signal components, wherein the orthogonal signal components are converted into electrical signal components, and wherein the control signal is obtained from the amplitudes of the electrical signal components.

19. (previously presented) The method as claimed in claim 18, wherein polarization planes of the orthogonal signals are set ±45° to a polarization plane of a

polarization splitter, and wherein the phase between the carrier signals is varied so that that the amplitudes of the electrical signal components have identical values.